

CLAIMS

- 1 1. A method for managing a data imaging service in a distributed computer system
2 having a host computer system with at least one storage device connected to the
3 computer system by driver software, the method comprising:
4 (a) inserting an interface layer between the driver software and the storage
5 device, the interface layer exporting a platform dependent API and
6 controlling data passing between the driver software and the storage
7 device;
8 (b) running, in the host system, a CIM object manager containing a CIM
9 provider that can make calls on the interface layer API;
10 (c) running, in a management server, management facade software including
11 a CIM client that can contact the CIM provider to control the CIM provider;
12 (d) running, in the management server, a federated bean that generates
13 method calls to the management facade to control the interface layer; and
14 (e) controlling the federated bean to designate master volumes, shadow
15 volumes and bitmap volumes and to transfer data between specified
16 master and shadow volumes.
- 17 2. The method of claim 1 wherein step (e) comprises controlling the federated bean
18 with a graphical user interface.
- 19 3. The method of claim 2 wherein step (e) further comprises placing the graphical
20 user interface in a location other than the host system and the management
21 server.
- 22 4. The method of claim 3 wherein step (e) further comprises using a lookup service
23 in the distributed computer system to locate the federated bean and obtain a
24 proxy thereto.

- 1 5. The method of claim 4 wherein step (e) further comprises using the federated
2 bean proxy in the graphic user interface to control the federated bean.
- 1 6. The method of claim 1 wherein step (e) comprises:
2 (e1) creating a volume set;
3 (e2) designating a master volume, a shadow volume and a bitmap volume as
4 part of the volume set; and
5 (e3) performing data imaging operations on the volume set.
- 1 7. The method of claim 6 wherein a plurality of volume sets are created and
2 wherein the method further comprises:
3 (f) creating a set group;
4 (g) adding selected volume sets to the set group; and
5 (h) controlling the set group with a single command to perform data imaging
6 operations on each set in the set group.
- 1 8. The method of claim 6 further comprising attaching an overflow volume to the
2 volume set.
- 1 9. The method of claim 6 wherein the computer system has a first host with a
2 volume set thereon and a second host and the method comprises exporting a
3 shadow volume in the volume set from the first host.
- 1 10. The method of claim 9 further comprising importing the shadow volume exported
2 by the first host into the second host.
- 1 11. The method of claim 1 wherein step (b) comprises using the CIM object manager
2 to instantiate a CIM provider object based on a managed object file.

- 1 12. The method of claim 11 wherein step (c) comprises using a management facade
2 factory to create a management facade object when a CIM provider object is
3 instantiated.
- 1 13. Apparatus for managing a data imaging service in a distributed computer system
2 having a host computer system with at least one storage device connected to the
3 computer system by driver software, the apparatus comprising:
4 an interface layer located between the driver software and the storage
5 device, the interface layer exporting a platform dependent API and controlling
6 data passing between the driver software and the storage device;
7 a CIM object manager running in the host system, the CIM object
8 manager containing a CIM provider that can make calls on the interface layer
9 API;
10 management facade software running in a management server, the
11 management facade software including a CIM client that can contact the CIM
12 provider to control the CIM provider;
13 a federated bean running in the management server, the federated bean
14 generating method calls to the management facade to control the interface layer;
15 and
16 means for controlling the federated bean to designate master volumes,
17 shadow volumes and bitmap volumes and to transfer data between specified
18 master and shadow volumes.
- 1 14. The apparatus of claim 13 wherein the means for controlling the federated bean
2 comprises a graphical user interface.
- 1 15. The apparatus of claim 14 wherein the distributed computer system includes a
2 network and wherein the means for controlling the federated bean further

3 comprises means for connecting the graphical user interface to the federated
4 bean over the network.

1 16. The apparatus of claim 15 wherein the distributed computer system comprises a
2 lookup service and wherein the means for controlling the federated bean
3 comprises means for using the lookup service to locate the federated bean and
4 obtain a proxy thereto.

1 17. The apparatus of claim 16 wherein the means for controlling the federated bean
2 comprises means for using the federated bean proxy to control the federated
3 bean.

1 18. The apparatus of claim 13 wherein the means for controlling the federated bean
2 comprises:

3 means for creating a volume set;
4 means for designating a master volume, a shadow volume and a bitmap
5 volume as part of the volume set; and
6 means for performing data imaging operations on the volume set.

1 19. The apparatus of claim 18 wherein a plurality of volume sets are created and
2 wherein the apparatus further comprises:

3 means for creating a set group;
4 means for adding selected volume sets to the set group; and
5 means for controlling the set group with a single command to perform data
6 imaging operations on each set in the set group.

1 20. The apparatus of claim 18 further comprising means for attaching an overflow
2 volume to the volume set.

- 1 21. The apparatus of claim 18 wherein the computer system has a first host with a
2 volume set thereon and a second host and the apparatus comprises means for
3 exporting a shadow volume in the volume set from the first host.
- 1 22. The apparatus of claim 21 further comprising means for importing the shadow
2 volume exported by the first host into the second host.
- 1 23. The apparatus of claim 13 wherein the CIM object manager comprises means for
2 instantiating a CIM provider object based on a managed object file.
- 1 24. The apparatus of claim 23 further comprising a management facade factory that
2 creates a management facade object when a CIM provider object is instantiated.
- 3 25. A computer program product for managing a data imaging service in a distributed
4 computer system having a host computer system with at least one storage
5 device connected to the computer system by driver software, the computer
6 program product comprising a computer usable medium having computer
7 readable program code thereon, including:
8 interface layer software inserted between the driver software and the
9 storage device, the interface layer software exporting a platform dependent API
10 and controlling data passing between the driver software and the storage device;
11 CIM object manager software operable in the host computer system
12 containing means for creating a CIM provider that can make calls on the interface
13 layer API;
14 management facade software operable in a management server including
15 a CIM client that can contact the CIM provider to control the CIM provider;
16 federated bean software operable in the management server, the
federated bean software generating method calls to the management facade to
control the interface layer; and

17 program code for controlling the federated bean to designate master
18 volumes, shadow volumes and bitmap volumes and to transfer data between
19 specified master and shadow volumes.

1 26. The computer program product of claim 25 wherein the program code for
2 controlling the federated bean comprises graphical user interface program code.

1 27. The computer program product of claim 26 wherein the program code for
2 controlling the federated bean further comprises program code for using a lookup
3 service in the distributed computer system to locate the federated bean and
4 obtain a proxy thereto.

1 28. The computer program product of claim 27 wherein the program code for
2 controlling the federated bean further comprises program code for using the
3 federated bean proxy in the graphic user interface to control the federated bean.

1 29. A computer data signal embodied in a carrier wave for managing a data imaging
2 service in a distributed computer system having a host computer system with at
3 least one storage device connected to the computer system by driver software,
4 the computer data signal comprising:

5 interface layer software for insertion between the driver software and the
6 storage device, the interface layer software exporting a platform dependent API
7 and controlling data passing between the driver software and the storage device;

8 CIM object manager software operable in the host computer system
9 containing means for creating a CIM provider that can make calls on the interface
10 layer API;

11 management facade software operable in a management server including
12 a CIM client that can contact the CIM provider to control the CIM provider;

